

W2

A5

N92g

2B

Mare Island, California
3 February 1948

Committee on Artificial Limbs
National Research Council
2101 Constitution Avenue
Washington, D. C.

DOCUMENTS SECTION

MONTHLY REPORT OF THE EXPERIMENTAL WORK AT THE ARTIFICIAL LIMB
SHOP, MARE ISLAND NAVAL HOSPITAL

During the month of January, Civil Service billets for a draftsman and engineer have been set up and we are interviewing applicants for these billets.

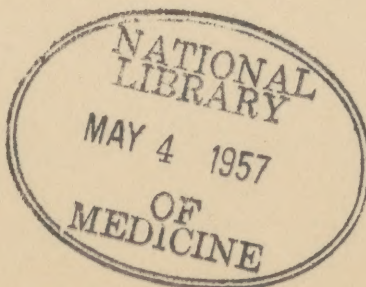
Representative and patients of this Center attended the Meeting of the National Research Council, Committee on Artificial Limbs, 7 to 10 January, 1948 at Berkeley, California. Amputees demonstrated the following prostheses:

1. Bilateral cineplastic arms with pectoralis motors, wrist pronators-supinators and wrist flexion and extension.
2. Bilateral cineplastic arms featuring bi-ceps motors with wrist pronation and supination.
3. Unilateral cineplastic arm featuring forearm motors. Robinson hand and cosmetic glove
Functional elbow joint, wrist pronation-supination and the motors connected to a hand lock.
4. Bilateral below elbow suction sockets, functional elbow joints and pronation-supination wrist connected to shoulder control and open bi-ceps cuff.
5. Wrist disarticulation prosthesis.
6. Above elbow suction socket with wrist pronation-supination.
7. Bilateral below knee suction sockets, functional ankle joints and soft sockets.

The following projects were demonstrated:

1. 75-ST forge aluminum hip, BK and AK joints.
2. Below knee and arm soft buckets.
3. Plastic laminate shins
4. AK knee brake

This Center was host for the group attending the meeting in which a lecture and tour of the Artificial Limb Department was given and the various projects and experimental work in the shop were presented.



1. FUNCTIONAL ANKLE JOINT:

Eight additional ankle joints have been installed for field testing. Two new designs of the ankle joint have been made up but were undesirable. Reports from amputees continue to be favorable. A number of cases have broken the ankle block which has split through the grain of the wood. We intend to use the $1\frac{1}{4}$ " plywood for this block in order to correct this deficiency.

2. SUCTION SOCKET:

(a) Above Knee: Twenty-three additional suction sockets have been fitted for field testing. Berger's disease in suction sockets reveal both subjective and objective improvement of circulation in the stumps. The patients say their stumps feel warmer and remain warm for three or four hours after removal of the prosthesis. Objectively the appearance of the stump and thermocouple and ossilometer readings show improvements. The second course of the suction socket school was completed and the reactions of both the surgeons and limb fitters were as favorable as those from the first course. A great many limb fitters expressed a desire for further courses in BK, arms, braces, and anatomy.

(b) Below Knee: It appears that for a successful BK suction socket it will be necessary to radically re-design the socket.

(c) Below Elbow: Below elbow suction sockets will also require a new design in order to make them successful. It is contemplated installing a sponge rubber ring inside the rim of the bucket in order to maintain good air seal.

(d) Above Elbow: Two new cases are being fitted with above elbow suction sockets and it appears that it is far easier to fit above elbow as compared to below knee and below elbow.

3. CINEPLASTIC ARMS:

The cineplastic arms already built are undergoing a field testing.

4. PRONATOR-SUPINATOR FOR ABOVE ELBOW:

This mechanism is working successfully for those amputees who are field testing it and an above elbow arm is being constructed to send to APRL.

5. ROBINSON HAND & COSMETIC GLOVE:

Two additional cases were fitted for field testing and we believe the hand will require redesigning and we intend to remove the equalizer from the fourth and fifth fingers in order to increase the gripping power of the hand, index, and middle fingers.

6. SOFT BUCKETS AND IMPRESSION METHODS FOR BELOW KNEE STUMPS:

Additional bases have been fitted and the field testing results continue to be favorable.

7. SELECTRON WITH FORTISAN LAMINATE:

We have made a number of shins with five layers of laminate which appear to be sufficiently strong. No reports have been received from the University of California who are testing two shins on their walking machines.

8. PRODUCTION METHODS FOR LIMB MANUFACTURING:

Production studies are continuing.

9. TILTING TABLE PROSTHESIS:

Two disarticulations are being fitted with tilting table prosthesis.

10. FUNCTIONAL JOINT FOR ELBOW, WRIST AND HIPS:

Additional cases have been fitted with this joint. Tests have been made which reveal that the joints sustain weights averaging 480# before separation. A set of joints have been designed which are smaller in outside diameter measurements which reduce the bulkiness of the joint to a considerable degree. This joint sustains weight up to 360# before separation. A prosthesis has been made for a meta-carpal amputation utilizing the functional joint at the wrist and elbow. This is a big improvement over the old type polymatic wrist joint.

11. FORGED ALUMINUM JOINTS:

75-ST forge aluminum joints are being installed routinely. Reports of field testing continue to be favorable.

12. SUCTION SOCKET VALVES:

We are designing a new flange for the Sierra suction socket valve in order to utilize that valve for BK, hand, arm suction sockets.

13. MECHANICAL KNEE LOCK:

Further work continues on the redesigning of the mechanical knee lock.

14. ADEL HYDRAULIC LEG:

Two models of the Adel hydraulic leg have been fitted to an amputee and are being tested and observed for functional value. Model No. 2 was found to be unsuccessful because of the alignment and Model No. 1 was altered both in alignments and ankle action which permitted the amputee to use this prosthesis more efficiently. At the present time the amputee is unable to negotiate stairs, but states that he can walk up and down ramps better than he can using a conventional prosthesis.

T. J. CANTY
Commander, MC USN
Officer in Charge
Artificial Limb Department